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of general indifference over general sensitiveness should prove to be a universal law, it might well be due to a failure on the part of a certain number of observers to give adequate attention to the stimuli, which would result not only in indifference judgments but in the suppression of whatever special influences might otherwise be exerted by special classes of stimuli.

#### XXIX. THE INFLUENCE OF FATIGUE ON AFFECTIVE SENSITIVENESS TO COLORS

By HARRIET ROBBINS, DOROTHY SMITH, and M. F. WASHBURN

In Minor Study Number XIV from the Vassar laboratory (this JOURNAL, volume 22, pp. 112-114), there were reported some experiments tending to show that colors are judged to be less agreeable at the end of a long series of such judgments than at the beginning; that is, that the fatigue induced by a long series of judgments on the affective values of colors lowers their affective value. Our object in the present study was to see how fatigue thus brought about would influence the affective sensitiveness of the observer to the colors; that is, not his tendency to find the colors pleasant or unpleasant, but his tendency to make judgments of an extreme rather than a moderate degree of either pleasantness or unpleasantness. Our method was somewhat more exact than that used in the former study.

The ninety colors of the Bradley series, represented by pieces of the colored papers 2.9 cm. square, were divided into four sets, designated as A, B, C, and D. Sets A and C were of twenty-two colors each; sets B and D of twenty-three colors each. The colors were chosen in random order to make the sets, but the pieces of paper were then numbered on the back so that the colors of a set should always be presented in the same order. Each piece of colored paper was laid by itself on a white background before the observer, who was asked to judge its pleasantness or unpleasantness using the numbers 1 to 7 in the usual way. The entire ninety colors (four sets) were presented thus twice over without pause, making 180 judgments of affective value at a sitting. The set that was used first at a sitting was also used last at the same sitting: thus, one order was: A, B, C, D, B, C, D, A; another, B, C, D, A, C, D, A, B. The observer was asked at the close of a sitting whether she felt tired or bored. For the series which had been presented at the beginning of the sitting and again at the end the following numerical values were calculated; the average affective value of the colors on their first presentation and on their second presentation (that is, the numbers obtained by averaging the numerical values assigned to the individual colors of the set), and secondly, the coefficients of affective sensitiveness for the colors on their first and on their second presentation (that is, the number of judgments '4,' or indifferent, divided by the sum of the numbers of '1,' very unpleasant, judgments and '7,' very pleasant judgments.)

There were 82 observers, all young women and undergraduate students. We were rather surprised to find that only 31 per cent. of them declared themselves bored at the end of the long series of 180 judgments. Five of the 82 observers said that they became more interested towards the end than they had been at the beginning.

Of those observers who reported being conscious of boredom, 34.6 per cent. showed higher affective values for the colors at the end of the series than for the same colors at the beginning, and 65 per cent. showed lower affective values. A difference of 30.4 per cent. represented the tendency of affective values to drop as the result of ennui. Of those observers who reported equal interest maintained throughout the experiment, 36 per cent. gave an average affective value higher for the colors on their second presentation, and 56 per cent. an average affective value lower for the colors on the second presentation: a difference of 20 per cent. indicating the observers who in spite of not recognizing boredom introspectively, showed a fall in the average degree of pleasantness assigned to the colors at the end of the series. Of the five observers who said they were more interested in the colors at the end than at the beginning, three showed a rise in the average affective values assigned to the colors and two a fall.

Turning to the coefficients of affective sensibility, we find that among the observers who reported ennui, 23 per cent. showed increased affective sensibility and 53 per cent. decreased affective sensibility, a difference of 20 per cent. in favor of the conclusion that ennui lowers the affective sensibility. Among the observers who reported equal interest throughout, 43 per cent. showed increased affective sensibility and 38 per cent. decreased affective sensibility. All of the five observers who said their interest increased showed increased affective sensibility.

These results indicate that, under the conditions of our experiments, affective sensibility to colors tends to diminish with ennui produced by a long series of judgments on the affective values of colors, and that diminution in affective sensibility is more closely correlated with introspective reports of ennui than is the average affective value of the colors. The percentages of observers who showed a lowering of the affective values of the colors were 65 for the observers who reported ennui, 56 for those who reported equal interest throughout, and 40 for the few who reported increased interest. The percentages of observers showing decreased affective sensibility were 53 for those reporting ennui, 38 for those reporting equal interest, and 0 for those reporting increased interest.

### XXX. THE SOURCE OF AFFECTIVE REACTIONS TO ARTICULATE SOUNDS

By LOUISE N. GARVER, JOSEPHINE M. GLEASON, and M. F. WASHBURN

So far as we know, the first experimental investigation of the pleasantness and unpleasantness produced by articulate sounds was made in this laboratory, the results being published in this JOURNAL, volume 23, pp. 579-583. The object of this study was to find what consonants and what vowels are most agreeable and most disagreeable when used in nonsense syllables composed of an initial vowel and a final consonant. During the experiments made in the investigation the question naturally suggested itself as to why certain articulate sounds should be agreeable and others disagreeable. The present study is an attempt to answer this question.

The material was again nonsense syllables composed of an initial vowel and a final consonant. The vowel sounds used were a as in ate, a as in father, a as in hat, aw, ee, e as in wet, i as in life, i